

NEW NAMES AND COMBINATIONS IN GOLDENRODS, *SOLIDAGO* (ASTERACEAE: ASTEREA)

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ABSTRACT

The following new names and combinations in *Solidago* are proposed: *Solidago* subsect. **Multiradiatae**, *Solidago* subsect. **Humiles**, *Solidago* ser. **Auriculatae**, *Solidago* ser. **Odorae**, *Solidago* ser. **Drummondiani**, *S. altissima* subsp. **gilvocanescens**, *S. kralii*, *S. lepida* subsp. **fallax**, *S. lepida* var. **salebrosa**, *S. odora* subsp. **chapmanii**, *S. patula* subsp. **strictula**, *S. puberula* subsp. **pulverulenta**, *S. rugosa* var. **cronquistiana**, *S. sempervirens* subsp. **azorica**, *S. sempervirens* subsp. **mexicana**, *S. speciosa* subsp. **pallida**, *S. stricta* subsp. **gracillima**, *S. velutina* subsp. **californica**, and *S. velutina* subsp. **sparsiflora**.

RESUMEN

Se proponen los siguientes nombres y combinaciones nuevos en *Solidago*: *Solidago* subsect. **Multiradiatae**, *Solidago* subsect. **Humiles**, *Solidago* ser. **Auriculatae**, *Solidago* ser. **Odorae**, *Solidago* ser. **Drummondiani**, *S. altissima* subsp. **gilvocanescens**, *S. kralii*, *S. lepida* subsp. **fallax**, *S. lepida* var. **salebrosa**, *S. odora* subsp. **chapmanii**, *S. patula* subsp. **strictula**, *S. puberula* subsp. **pulverulenta**, *S. rugosa* var. **cronquistiana**, *S. sempervirens* subsp. **azorica**, *S. sempervirens* subsp. **mexicana**, *S. speciosa* subsp. **pallida**, *S. stricta* subsp. **gracillima**, *S. velutina* subsp. **californica**, y *S. velutina* subsp. **sparsiflora**.

The following new names and combinations were determined to be needed during work to prepare the treatment of *Solidago* for *Flora North America* (Semple & Cook, submitted). Ten of the new combinations treat taxa as subspecies that usually have been recognized as varieties. The definitions of the ranks follow Semple (1974). In each case, the subspecies is morphologically distinct and has a distribution that is nearly allopatric from the other subspecies within the respective species. Intermediates between the subspecies occur in the areas of sympatry. Ranges of varieties overlap considerably, with pure and intermediate populations occurring intermixed within the range of the variety. Hamilton and Reichard (1992) noted inconsistencies in application of the ranks to taxon, and some of the combinations proposed here correct such inconsistencies within *Solidago* in North America. Subsection and series names are proposed to fit my opinions on how species should be grouped within the genus; a full infrageneric nomenclature is included in Semple and Cook (submitted).

Solidago subsect. **Multiradiatae** (Juz.) Semple, comb. nov. BASIONYM: *Solidago* ser. *Multiradiatae* Juz., Fl. U.R.S.S. 25: 47. 1959. TYPE: *Solidago multiradiata* L.

Solidago subsect. **Humiles** (Rydb.) Semple, comb. et stat. nov. BASIONYM: *Solidago* (sp.-group) *Humiles* Rydb., Fl. Rocky Mts. 868. 1917. TYPE: *Solidago humilis* A. Gray (1884), non Pursh (1814). [= *S. simplex* Kunth]

Solidago ser. **Auriculatae** Semple, ser. nov. TYPE: *Solidago auriculata* Shuttlew. ex S.F. Blake

Solidagini subsect. *Argutae* (Mackenzie) Nesom accedens sed foliis auriculatissimis differt.

The leaves are distinctly auriculate clasping. The basal leaves are largest and petiolate like other *Argutae*.

Solidago ser. **Odorae** (Mackenzie in Small) Semple, comb. et stat. nov. BASIONYM: *Solidago* (sp.-group) *Odorae* Mackenzie in Small, Man. SE. Fl. 1345, 1346. 1933. *Solidago* subsect. *Odorae* (Mackenzie in Small) Nesom, Phytologia 75:10. 1993. TYPE: *Solidago odora* Aiton.

Solidago ser. **Drummondiani** Semple, ser. nov. TYPE: *Solidago drummondii* Torr. & A. Gray.

Solidagini ser. *Venosae* G. Don accedens sed foliis caulis ovatis triplinervis differt.

Lower mid stem leaves ovate, serrate and with two, large, lower lateral veins (triple-nerved) as well as additional less enlarged upper lateral veins

Solidago altissima L. subsp. **gilvocanescens** (Rydb.) J.C. Semple, comb. et stat. nov. BASIONYM: *Solidago canadensis* L. var. *gilvocanescens* Rydb., Contr. U.S. Natl. Herb. 3:162. 1895. *Solidago gilvocanescens* (Rydb.) Smyth, Trans. Kansas Acad. Sci. 16:161. 1899. *Doria gilvocanescens* (Rydb.) Lunell, Amer. Midl. Naturalist 5:43. 1917. *Solidago canadensis* L. ssp. *gilvocanescens* (Rydb.) Löve & Löve, Taxon 31:358. 1982. *Solidago altissima* L. var. *gilvocanescens* (Rydb.) Semple, Phytologia 58:430. 1985. TYPE: U.S.A. NEBRASKA. Hooker Co.: Cody's Lakes at the head of the Dismal R, sandy soil, 10 Aug 1893, Rydberg 1662 (HOLOTYPE: US, photo!; ISOTYPES: GH!, NY2, photos!).

Subspecies *gilvocanescens* includes diploids and tetraploids of *S. altissima* found across the Great Plains from southern Canada to Texas. Subspecies *altissima* includes hexaploids throughout its range in eastern North America from the edge of the Great Plains eastward from Nova Scotia to northern Ontario and eastern Manitoba south to northern Florida and eastern Texas; a few tetraploids are known from Arkansas and Tennessee. The subspecies differ in head and floret size and are difficult to distinguish where the two ranges overlap.

Solidago kralii Semple, sp. nov. (**Figs. 1–11**). TYPE: U.S.A. GEORGIA. Pulaski Co.: ca. 1–1.5 mi S of jct. US-341 and GA-230 at Hartford, longleaf pine scrub hills, 10 Aug 1975, R. Kral 56345 (HOLOTYPE: VDB!; ISOTYPE: MO!).

Solidagini plumosa Small accedens sed capitulescentiis viscidis resinosissimis differt.

Herbaceous perennials from creeping rhizomes. Stems 6.5–12 dm tall, glabrous to sparsely strigulose in capitulescence, often copiously viscid resinous in capitulescence. Basal leaves petiolate, blade gradually tapering to winged petiole, oblanceolate, (2.5–)10–20 cm long, (4–)15–28 mm wide, main vein prominent,

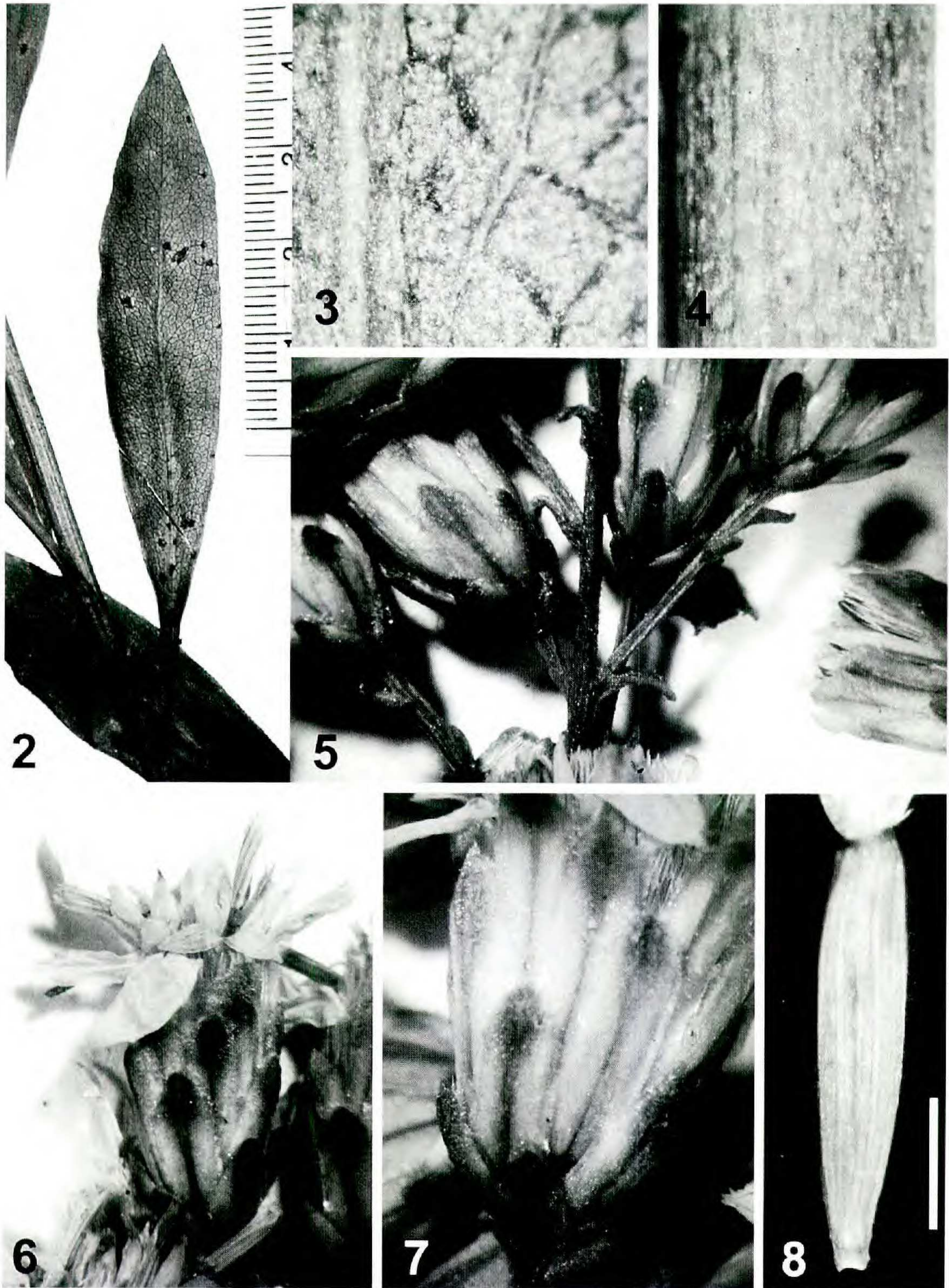
HOLOTYPE: *Solidago kralii* Semplé, sp. nov., mss.
John C. Semplé, WAI
28 May 2017 University of Waterloo

Herbarium
VDB
150271



PLANTS OF Georgia
Pulaski Co.: 10 Aug 1975 R.Kral 56345
Solidago speciosa Nutt.
Longleaf pine scrub sandhills ca. 1-1.5 m
s. jct. US 341 and Ga. 230 at Hartford.
Det.: R.Kral

FIG. 1. Holotype of *Solidago kralii*, R. Kral 56345 (VDB).



FIGS. 2–8. Details of the morphology of *Solidago kralii*. 2. Mid stem leaf, scale bar in cm. 3. Mid stem leaf surface detail by mid vein. 4. Stem. 5. Portion of capitulescence. 6. Capitulum. 7. Involucre. 8. Mature cypsela, glabrous body, scale bar = 1 mm.



FIGS. 9–11. Ecology of *Solidago kralii*. **9.** Road margin habitat through sand hill; Ben Hill Co., Georgia (Semple & Semple 11216). **10.** Habit of 1 m tall robust individual; Richmond Co., Georgia (Semple & Semple 11217). **11.** Large bee visitor on flowering head; Pulaski Co., Georgia (Semple & Semple 11208).

membranous, glabrous, viscid, margins shallowly serrate apically, teeth less than 1 mm long, finely ciliate; rosettes present at flowering, forming at the ends of elongated rhizomes, first leaves produced the smallest. Lower to mid stem leaves similar to basal to sessile and linear elliptic, quickly reduced, mid stem leaves 4–8 cm long, 6–9 mm wide, reduced upward, viscid, entire. Upper stem leaves sessile, linear elliptic to linear, 10–35 mm long, 1–3 mm wide, reduced into capitulescence, glabrous, viscid. Capitulescence narrowly thyriform

paniculiform, 9–30(–40) cm long, 4–7(–12) cm wide, longer branches ascending, 2–4(–15) cm long; heads 1–9(–15) per branch. Peduncles sparsely strigulose, somewhat to copiously resinous, naked below to bracteolate near heads, bracteoles usually 1–3. Involucres campanulate, 5–7 mm high. Phyllaries in 3–4 strongly graduated series, the outer ovate 1.5–2 mm long, middle ones 3–4 mm long, narrowly ovate, to 1.5 mm wide, inner linear lanceolate, apex obtuse, rounded to slightly cuspidate, ciliate, surfaces often copiously resinous, very sparsely finely strigose and obscured by exudate. Ray florets 3–5(–11), strap 2.5–3.5 mm long, 1–1.5 mm wide. Disc florets 10–16(–20), corolla 5–6 mm long, lobes 1–1.5(–1.8) mm long. Cypselles fusiform to narrowly obconic, 3–5 mm long, 5–8 golden brown thin ribs darker than intercostal portions, glabrous; pappus bristles 4–5 mm long, sometimes strongly clavate. $2n = 18$.

Flowering August–September. Turkey oak and pine scrub sandhills; Ga., S.C.

Kral's Goldenrod is closely related to *S. simplex* Kunth, *S. plumosa* Small and *S. arenicola* Kral & Keener, the latter two and *S. kralii* possibly being divergent and isolated relicts of a common ancestor more widely distributed across the southeastern United States during late glacial times. *Solidago kralii* is often much more copiously viscid resinous than these other three species. The involucres of *S. arenicola* are much taller than those of *S. kralii* and *S. plumosa*. Recently made field collections of *S. kralii* tended to stick somewhat to the newsprint in which specimens were dried. *Solidago kralii* is nearly always found in full sun on sandhills (Fig. 9); the sites can be highly disturbed. Population sizes varied from one to several dozen or more individuals, the exact number not being determined during recent field observations. Individuals were observed in the field with more than three dozen robust shoots up to 1 m tall (Fig. 10). In general, plants of *S. arenicola* observed in the field in September 2003 were much shorter, had fewer shoots, and were only found in partially shaded sandy soils of river banks in northern Alabama. *Solidago plumosa* can be as tall as *S. kralii*, but it is known only from the type location in Stanly Co., North Carolina on a very limited section of the rocky margins of the Yadkin River, a habitat observed in September 2003 that was, prior to dam construction, probably similar to the habitat of tetraploid *S. simplex* var. *racemosa* (E.L. Greene) Ringius along the Potomac River near the Great Falls of the Potomac in Maryland observed in 1984 (Semple & Ringius 7663 WAT; Ringius and Semple 1987).

Chromosome counts for *S. kralii* determined from two locations were both were diploid: $2n = 18$, **U.S.A. Georgia. Pulaski Co.:** S of Hartford, GA-230 1 km SE of US-341/GA-27, 23 October 2001, R. Cook et al. 701 (WAT; shoots well past blooming); $2n = 9_{II}$, **U.S.A. Georgia. Richmond Co.:** US-1, NE of Blythe, S of Ellis Pond, steep roadside embankment, sand hill, 7 Sep 2003, J. Semple & B. Semple 11217 (WAT).

The species is named in honor of Dr. Robert Kral (VDB) who collected the specimens that first brought the species to my attention. He is well known for

his work on the flora of the southeastern United States over many years and for his numerous collections deposited in VDB and duplicates in many other herbaria in eastern North America.

Additional collections: **U.S.A. GEORGIA. Ben Hill Co.:** US-129 at S edge of Bowens Mill town limits, just N of GA-182, 7 Sep 2003, *J. Semple & B. Semple 11212* (WAT); S of Bowens Mill, US-129 0.4 km S of GA-182, 7 Sep 2003, *J. Semple & B. Semple 11216* (WAT); 8.2 mi N of Fitzgerald, sandhills by US-129, 25 Sep 1975, *Kral 56788* (MO, VDB). **Pulaski Co.:** W side of Hartford, US-341 0.9 km E of GA-26, just E of radio station, 7 Sep 2003, *J. Semple & B. Semple 11208* (WAT). **Richmond Co.:** Ft. Gordon Military Res., turkey oak sandhills, *S.B. Jones 15123* (USF). **SOUTH CAROLINA. Aiken Co.:** N of Graniteville, Interstate-20, embankment, road right-of-way, 8 Sep 2003, *J. Semple & B. Semple 11218* (WAT).

Solidago lepida DC. subsp. ***fallax*** (Fernald) Semple, stat. nov. BASIONYM: *Solidago lepida* DC. var. *fallax* Fernald, *Rhodora* 17:9–10. 1915. Fl. S. Brit. Columbia 301. 1915. *Solidago elongata* Nutt. var. *fallax* (Fernald) G.N. Jones, *Univ. Wash. Publ. Biol.* 5:242. 1936. *Solidago canadensis* L. var. *fallax* (Fernald) Beaudry, *Naturaliste Canad.* 95:37. 1968. TYPE: CANADA. NEWFOUNDLAND: Harry's River, gravelly thicket, 18 Aug 1910, *Fernald & Wiegand 4108* (HOLOTYPE: GH!; ISOTYPE: NY photo!).

A discussion of all species in *Solidago* subsect. *Triplinervae* is in preparation to explain the taxonomic treatment of the subsection in Semple and Cook (submitted). In the treatment, *S. lepida* is the very sparsely to moderately glandular member of the subsection. Subspecies *lepida* is primarily a western taxon found from Alaska through the mountains to northern California and New Mexico and across northern Canada to Ontario and rarely to New Brunswick and the Gaspé, Québec. Subspecies *fallax* occurs in Newfoundland south to New Brunswick and rarely to northern Ontario. It has upper stems leaves with more numerous and larger serrations than occur on leaves of either var. *lepida* or var. *salebrosa* of subsp. *lepida*. Subspecies *fallax* is only very sparsely glandular with minute stipitate glands on the phyllary margins or tips.

Solidago lepida DC. var. ***salebrosa*** (Piper) J.C. Semple, comb. nov. BASIONYM: *Solidago serotina* Ait. var. *salebrosa* Piper in Piper & Beattie, *Fl. Palouse Region*, 185. 1901. *Solidago canadensis* L. var. *salebrosa* (Piper) M.E. Jones, *Bull. Univ. Montana, Biol. ser.* 15:49. 1910. *Solidago salebrosa* (Piper) Rydb., *Fl. Rocky Mts.* 870, 1067. 1917. *Solidago gigantea salebrosa* (Piper) Friesner, *Butler Univ. Bot. Stud.* 4:196. 1940. *Solidago gigantea* Ait. var. *salebrosa* (Piper) Friesner, *Butler Univ. Bot. Stud.* 5:113. 1941. *Solidago canadensis* L. ssp. *salebrosa* (Piper) Keck, *Aliso*, 4:104. 1958. TYPE: U.S.A. WASHINGTON: Pullman, Piper 1580 (HOLOTYPE: WS!; ISOTYPE: GH!)

Minute stipitate glands occurs on capitulescence structures (upper most stem leaves, bracts, peduncles and/or phyllaries) in *S. lepida* var. *salebrosa*, which differs from var. *lepida* in having arching, elongated lower branches in the capitulescence.

Solidago odora Aiton subsp. ***chapmanii*** (A. Gray) J.C. Semple, comb. nov. BASIONYM: *Solidago chapmanii* A. Gray, *Proc. Amer. Acad.* 16:80. 1880. *Solidago odora* Ait. var. *chapmanii* (A. Gray) Cronq., *Brittonia* 29:224. 1977. SYNTYPES: U.S.A. FLORIDA: "pine barrens, *Chapman s.n.* (GH!, NY photo!). Levy Co.: Nov 1877, *Dr. Gar-*

ber s.n. (GH!, LECTOTYPE, here designated; GH!, ISOLECTOTYPE, here designated). The Garber collections at GH are marked 'n.sp. A. Gray'; the Chapman collection at GH is not. The Lectotype was selected because the label includes in Gray's hand "odorless form" and has heads in anthesis; its capitulescence has elongated lateral branches due to damage to the apex of the primary axis. The other Garber collection has two shoots, both with primarily fruiting heads.

Solidago patula Muhl. ex Willd. subsp. **strictula** (Torr. & A. Gray) J.C. Semple, stat. nov. BASIONYM: *Solidago patula* Muhl. var. *strictula* Torr. & A. Gray, Fl. N. Amer. 2:213. 1841. TYPE citation: "North Carolina! to Florida! and Louisiana!" SYNTYPES: U.S.A. LOUISIANA: *Drummond* s.n. (GH!, LECTOTYPE designated here because it is a more complete specimen; narrow-paniculate secund capitulescence and lower portion of stem with petiolate leaves, T. & G. FNA label annotated by Gray as "*S. patula* [beta] *strictula*"). *Hale* s.n. (GH!; narrow-paniculate capitulescence and portion of upper stem; on the same sheet with the Lectotype). Another collection by Drummond at GH has several labels: 1) "Jacksonville, Louisiana. T. Drummond. Hooker misit January 1835"; 2) "1870 Herb. From Herb J. Gay purchased by Dr. Hooker"; 3) "*S. patula* var. *strictula*" in Gray's hand on his SYN. FL. N. AMER. label; and 4) an annotation by Dr. G. Morton 1970 with the identification "*Solidago patula* Muhl." While this specimen was seen by Gray at some point, there is no indication it was seen before 1841 and, therefore, is rejected as a possible syntype.

Solidago puberula Nutt. subsp. **pulverulenta** (Nutt.) J.C. Semple, comb. et stat. nov. BASIONYM: *Solidago pulverulenta* Nutt., Gen. Pl. 161. 1818. non Bush (1918). *Solidago puberula* var. *pulverulenta* (Nutt.) Chapm., Fl. South. U.S. 210. 1860. TYPE: U.S.A. GEORGIA: s.d., *Nuttall* s.n. (HOLOTYPE: not seen; possible ISOTYPE: DH-122552!).

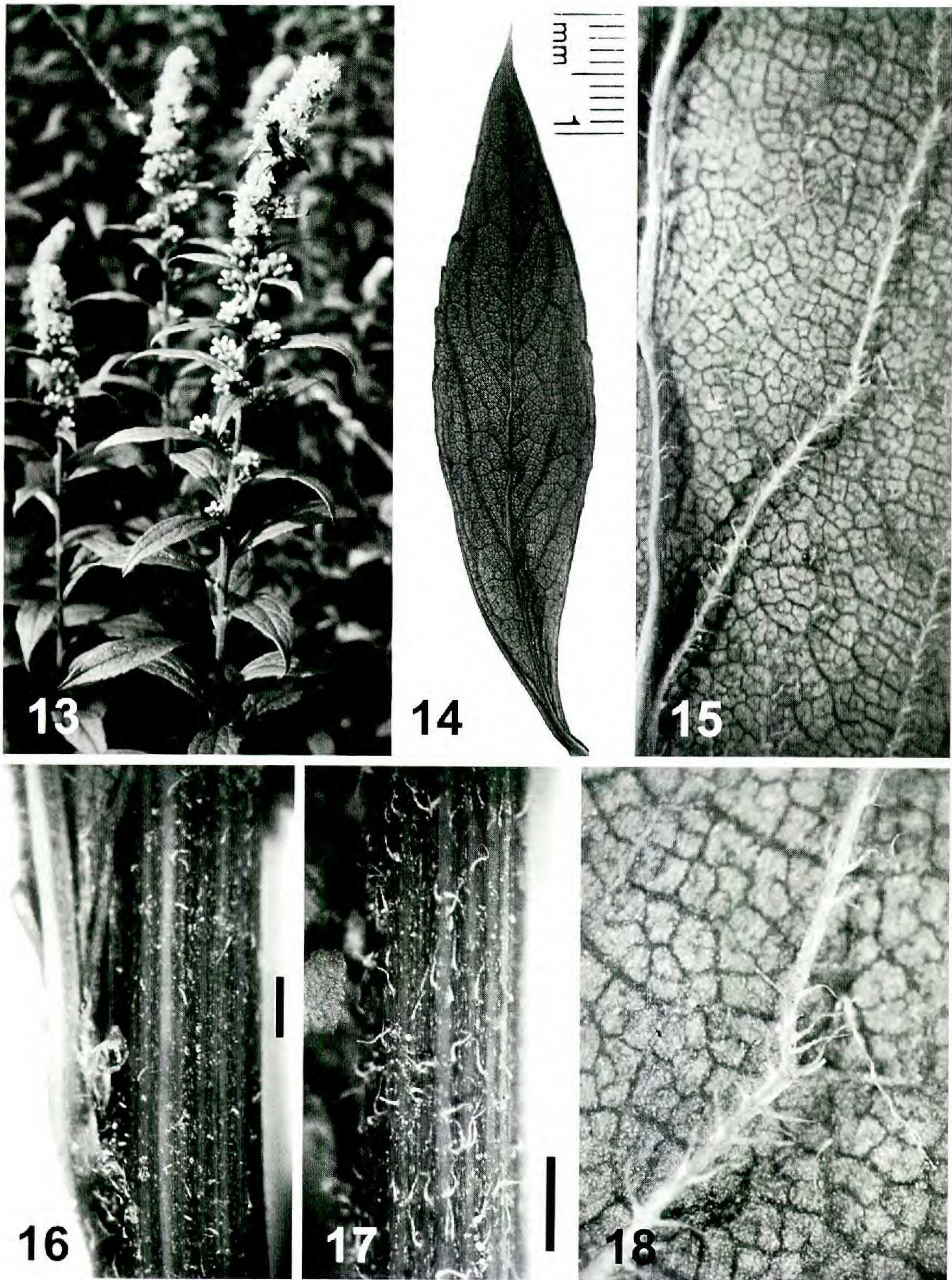
Solidago rugosa Mill. var. **cronquistiana** Semple, var. nov. (Figs. 12–18). TYPE: U.S.A. NORTH CAROLINA. Mitchell Co.: top of Roan Mt., 6250 ft. el., Forest Rd.-30 near parking lot, 15 Sep 1991, *Semple & Suario* 9666 (HOLOTYPE: WAT; ISOTYPES to be distributed: MO, NCU, NY).

Solidagini rugosi var. *asper*i accedens sed capitulescentia ramis brevibus loliis subtentibus nunc vix longioribus nunc brevioribus et caulibus sparsim hispidis differt.

Solidago rugosa var. *cronquistiana* possesses a mixture of traits that are seen in both var. *aspera* and var. *rugosa* (the *villosa* morph). The leaves are usually strongly rugose like those of var. *aspera*, but not as densely hairy. The branches of the elongated capitulescence are usually short and more like those seen in morphs of var. *rugosa* traditionally assigned to the var. *villosa*, but lacking the dense pubescence of the latter. The lowest capitulescence branches of very robust plants can be elongated and repeat the pattern of the upper portion of the capitulescence (e.g. *Semple & Suario* 9829); a similar phenomenon is seen in the virgate capitulescences of robust plants of other species of goldenrods such as *S. hispida* and *S. bicolor*. Based on field observations and knowledge of type material in *S. rugosa*, my first impression of the type collection made in 1991 was that it did not fit well into any previously described race of the *S. rugosa* complex. Additional collections were made in the Appalachian Mts. of North Carolina and extreme northern Georgia. The taxon likely also occurs at higher



FIG. 12. Holotype of *Solidago rugosa* var. *cronquistiana*, Semple & Surtpto 9666 (WAT).



FIGS. 13–18. Details of the morphology of *Solidago rugosa* var. *cronquistiana* (Semple & Suropto 9666). **13.** Capitulescence of wild plant with wasp visitor. **14.** Mid stem leaf, abaxial surface. **15.** Detail of abaxial surface of upper mid stem leaf. **16.** Upper mid stem. **17.** Stem just below capitulescence. **18.** Enlarged area of lateral vein shown in 15. Scale bars in 16–17 equal 1 mm.

elevations in adjacent eastern Tennessee and western Virginia. All chromosome determinations made for the new variety were tetraploid. Overall, var. *cronquistiana* appears closer to var. *aspera* than to var. *rugosa* and is thus assigned to subsp. *aspera*.

The new variety is named in honor of the late Dr. Arthur Cronquist, whose work on composites is well known and whose occasional phone calls (usually at night or on weekends) on matters Astereae were both enlightening and entertaining.

Additional collections of var. *cronquistiana*: **GEORGIA. Rabun Co.:** GA-15 2 km N of Tallulah Falls, 21 Sep 1991, *Semple & Suropto* 9828 (WAT). **NORTH CAROLINA. Avery Co.:** Beech Mountain, Beech Mt. Parkway just W of Red Oak Rd., 4 Sep 2002, *Semple* 11131 (WAT); E of Linville, Grandfather Mt., ca. 5000 ft el., 15 Sep 1991, full sun, *Semple & Suropto* 9674 (WAT); partial shade, *Semple & Suropto* 9675 (WAT); US-221 S of Linville, 17 Sep 1991, *Semple & Suropto* 9698 (WAT); between Linville and Roseborough, Roseborough Rd., E of Blue Ridge Parkway, 3 Sep 2002, *Semple & B. Semple* 11120 (WAT). **Mitchell Co.:** top of Roan Mt., ca. 6260 ft el., Roan High Bluff Rd. (For.Rd.-130), 15 Sep 1991, *Semple & Suropto* 9667 (WAT); 15 Oct 1999, *Semple* 10808 (WAT). **Watauga Co.:** Deep Gap, US-221 just N of US-431, 5 Sep 2002, *Semple & B. Semple* 11135 (WAT).

Collections of aff. var. *cronquistiana*: **U.S.A. GEORGIA. Rabun Co.:** GA-15 2 km N of Tallulah Falls, 21 Sep 1991, *Semple & Suropto* 9829 (WAT, sample includes robust plants with elongated lower capitulescence branches). **NORTH CAROLINA. Wilkes Co.:** US-421 11.8 km E of Watauga Co. line, 17 Sep 1991, *Semple & Suropto* 9707 (WAT, the capitulescence is damaged). Duplicates of *Semple* collections to be distributed.

Solidago sempervirens* L. subsp. *azorica (Hochst. ex Seubert) Semple, comb. et stat. nov. BASIONYM: *Solidago azorica* Hochstetten ex Seubert, Fl. Azor. 31. t. 10. 1844. *Solidago sempervirens* L. var. *azorica* (Hochst. ex Seubert) St. John, Rhodora 17:27. 1915. TYPE: AZORES, *Hochstetten* 107 (not seen), St. Michael, s.d., *Hccnt? Esq. s.n.*, d.Schp-Bip. (GH!). The label is handwritten and difficult to read.

Solidago sempervirens* L. subsp. *mexicana (L.) Semple, comb. et stat. nov. BASIONYM: *Solidago mexicana* L., Sp. Pl. 879. 1753. non Kunth (1818), nec Berlandier ex DC. (1836). *Solidago sempervirens* L. var. *mexicana* (L.) Fern., Rhodora 37:447. 1935. SYNTYPES: Hort. Clifford 409, *Solidago* 1 (LECTOTYPE designated here if not done so previously: BM!). Herb. Linn. 998.13 [?] (LINN!). Both specimens are immature fragments and thus not ideal as type material for a taxon to be distinguished on the basis of mature head characteristics. The Clifford specimen is larger and more complete.

Solidago speciosa* Nutt. subsp. *pallida (Porter) Semple, comb. et stat. nov. BASIONYM: *Solidago speciosa* Nutt. var. *pallida* Porter, Bull. Torrey Bot. Club 19:130. 1892. *Solidago pallida* (Porter) Rydb., Bull. Torrey Bot. Club 33:153. 1906. SYNTYPES: U.S.A. COLORADO. [Jefferson Co.]: Bergen Park, Aug 1877, *E.L. Greene* (LECTOTYPE designated here: NY ex Columbia!). Canada: Mt. Mackay, Sep 1889, *Britton* (not seen; the subspecies does not occur in Canada).

Solidago stricta* Aiton subsp. *gracillima (Torr. & A. Gray) Semple, comb. et stat. nov. BASIONYM: *Solidago gracillima* Torr. & Gray, Fl. N. Amer. 2(2):215. 1842. SYNTYPES: U.S.A. FLORIDA: "middle," *Dr. Chapman s.n.* (LECTOTYPE, here designated: NY!; specimen with the capitulescence with three long secund branches;

ISOLECTOTYPES or just SYNTYPES if not duplicates of the lectotype collection: KEW(2)!, NY!). Chapman collection labels often lack sufficient information to determine which specimens from the same location are duplicates of a single collection or unicates of separate collections.

Solidago velutina DC. subsp. **californica** (Nutt.) Semple, comb. et stat. nov. BASIONYM: *Solidago californica* Nutt., Trans. Amer. Phil. Soc. n.s. 7:328. TYPE: U.S.A. CALIFORNIA: Santa Barbara, *Nuttall s.n.* (HOLOTYPE: BM!).

Solidago velutina DC. subsp. **sparsiflora** (A. Gray) Semple, comb. et stat. nov. BASIONYM: *Solidago sparsiflora* A. Gray, Proc. Amer. Acad. 12:58. 1877. TYPE: U.S.A. ARIZONA: near Camp Lowell, 1874, *Rothrock 706* (HOLOTYPE: GH!).

ACKNOWLEDGMENTS

This research was supported by a Natural Sciences and Engineering Council of Canada Discovery Grant. Guy Nesom is thanked for his useful review comments and assistance with the Latin diagnoses. Brenda Semple is thanked for her assistance in the field.

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